# The Mathematics Assessment

The NAEP mathematics assessment measures students' ability to solve problems in five mathematics content strands: Number Properties and Operations; Measurement; Geometry; Data Analysis, Statistics, and Probability; and Algebra. Within each of these five content strands, students are asked questions that involve low, moderate, and high mathematical complexity. Mathematical complexity deals with what students are asked to do in a task.

The mathematics assessment includes multiple-choice questions, short-answer constructed-response questions, and extended constructed-response questions. The extended exercises allow students to communicate their ideas and demonstrate the reasoning they used to solve problems. The short-answer and extended-response questions make up approximately 50 percent of student assessment time. The assessment also incorporates the use of calculators, rulers, protractors, and ancillary materials such as spinners and geometric shapes in some parts of the assessment, but not all.

Scientific calculator use is permitted on approximately one-third of the test questions. At grade 8, students may use their own scientific or graphing calculators. These items are designed so that students who bring their own graphing calculator are not at an advantage compared to students who use the scientific calculator provided. For more information regarding the mathematics assessment framework, please visit http://www.nagb.org.

***NAEP Mathematics Framework***
***Distribution of Questions Across Content Strands***

| | **Grade 8** |
|---|---|
| Number Properties and Operations | 20% |
| Measurement | 15% |
| Geometry | 20% |
| Data Analysis, Statistics, and Probability | 15% |
| Algebra | 30% |

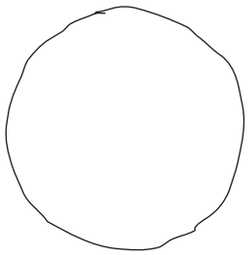
# Mathematics Booklet Directions

This assessment uses many different booklets. Each booklet has different questions. Do not worry if the person next to you is working on questions that do not look like those you are working on.

Read each question carefully and answer it as well as you can. Do not spend too much time on any one question.

For some of the questions you may need to write or draw the answer. You can see how this is done in the example below.

Draw a circle in the space below.



You may be permitted to use a calculator for at least one part of your booklet. You may use either your own calculator or the calculator provided by NAEP. If you are permitted to use a calculator, you will have to decide when to use it in each section where its use is permitted. For some questions using the calculator is helpful, but for other questions the calculator may not be helpful.

If you are using the calculator provided by NAEP, make sure you know how to use it before beginning the section. There are instructions on the back cover of this booklet to help you. If the calculator does not work or if you do not know how to use it, raise your hand and ask for help.

**REMEMBER:**

Read each question CAREFULLY.

Fill in only ONE OVAL for each question or write your answer in the space provided.

If you change your answer, ERASE your first answer COMPLETELY.

CHECK OVER your work if you finish a section early.

**Do not go past the STOP sign at the end of each section until you are told to do so.**

# Sample Mathematics Questions
## Grade 8

1. Of the following, which is the best unit to use when measuring the growth of a plant every other day during a 2-week period?

   ● Centimeter

   Ⓑ Meter

   Ⓒ Kilometer

   Ⓓ Foot

   Ⓔ Yard

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2. Jaime knows the following facts about points *A*, *B*, and *C*.

   • Points *A*, *B*, and *C* are on the same line, but might not be in that order.

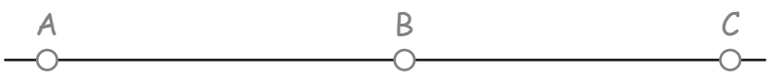
   • Point *C* is twice as far from point *A* as it is from point *B*.

   Jaime concluded that point *C* is always between points *A* and *B*.

   Is Jaime's conclusion correct?

   ○ Yes ● No

   In the space provided, use a diagram to explain your answer.

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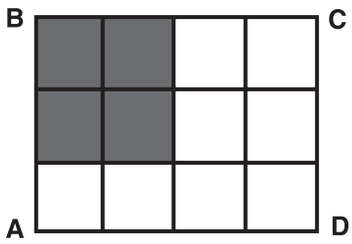


3. In the figure above, what fraction of rectangle ABCD is shaded?

Ⓐ $\frac{1}{6}$

Ⓑ $\frac{1}{5}$

Ⓒ $\frac{1}{4}$

● $\frac{1}{3}$

Ⓔ $\frac{1}{2}$